term toxicity and efficacy data are clearly crucial and will be reported in due course.

EP-1258

Early experience in SBRT with VMAT and flattening filter-free (FFF) beams. Phase I-II trial

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Purpose/Objective: To evaluate the feasibility and toxicity of hypofractionated stereotactic body radiation therapy (SBRT) with volumetric modulated arc therapy (VMAT) and flattening filter-free (FFF) beams.
Materials and Methods: A prospective designated phase I-II study was approved by our institutional review and ethics board (started in April 2013). Inclusion criteria were histologically proven prostate adenocarcinoma, Gleason Score 6–7, clinical stage T1b–T2b, prostate-specific antigen (PSA) ≤ 20 ng/mL, prostate volume ≤ 60 cc, no previous surgery, no malignant tumours in the previous 5 years, IPSS 0–7 Neo-adjuvant/concomitant hormonal-therapy was prescribed according to risk classification. Image Guided RT with Cone Beam CT (with or without fiducial markers) is mandatory. Urinary catheter was needed to plan and deliver radiation in order to maintain bladder volume stable during treatment. SBRT was delivered at a prescribed planning target volume (PTV) dose of 35 Gy in five fractions in 5 alternative days using the TrueBeam with RapidArc VMAT, with 6 MV FFF photons. CTCAE v3.0 morbidity scores were used to assess toxicities.
Results: A total of 11 patients have been recruited to date. Mean age of the patients was 71.2 years (range: 64–76 yr). Pathology centralized Gleason score was 6 in 6 patients and 7 (3+4) in another five patients. Mean PSA was 9 ng/mL (range: 0.03–17 ng/mL). According to D'Amico risk classification, 6/11 patients were low-risk and 5/11 were intermediate risk. Mean prostate volume was 38.3 cc. All patients completed the treatment as programmed in 2 weeks and tolerated the treatment well. One haematuria related to renal colic and hypertensive crisis were observed in two different patients at the first session. Evaluating patients in a time period ranging from 3 to 18 months, no toxicity greater than grade 2 was observed. . Acute Toxicities were as follow: Rectum G0: 2/11 cases (18.2%); G1: 5/11 (45.6%); G2: 4/11 (36.4%). Genito-urinary: G1: 8/11 (72,3%); G2: 3/11 (27,3%). At 3 months follow-up toxicities were as follow: Rectum G0: 5/11 cases (45.6%); G1: 6/11 (54,5 %); G2: 1/11 (9.1%). Genito-urinary: G0: 4/11 (36.4%), G1: 6/11 (54.5 %); G2: 1/11 (9.1%).Test between average total IPSS at pre-entry when compared with 1-month and 3-month evaluations showed a non-significant increase in mean value from 4 to 6. Biochemical response was seen at 3 month of follow-up with mean value of 2.1 ng/ml (range from 0.03 to 5.89).
Conclusions: Early findings indicate that SBRT with VMAT and FFF beams for low-intermediate-risk prostate cancer delivered in five fractions is feasible and well tolerated in selected patients. Long-term follow-up is needed for assessment of late toxicity and outcomes.

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Endorectal ballooning with posterior rectal wall dose constraint in prostate cancer radiotherapy

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Purpose/Objective: Anterior rectal wall (ARW) receives inevitable high radiation dose in prostate cancer radiotherapy. The rectum-protective effect of endorectal ballooning (ERB) was assessed in terms of separate anatomic categorization focusing ARW and its dose distribution.
Materials and Methods: Between Aug 2012 and Mar 2014, thirty one patients received curative tomotherapy for prostate cancer treatment. All treatment sessions were performed by intensity-modulated simultaneous integrated boost method to each target volume with customized 60 mL air balloon inserted into the rectum. The prescription dose was 70.0 Gy, 60.2 Gy, and 50.4 Gy to each planning target volume (PTV) for prostate gland (PG), seminal vesicles, and elective pelvic lymph node area with 28 fractionations, respectively. The ARW and posterior rectal wall (PRW) were contoured separately with 5 mm-thickness through the ERB-inflated rectum area. In thirteen patients (49.1%, Group 1), PRW dose was restricted to maximum 40 Gy without ARW dose fixing. The other 18 patients (58.1%, Group 2) were treated by conventional dose constraint without additional dose condition to PRW area.
Results: All patients completed their scheduled radiotherapy courses. The PG PTV dose distribution did not differ between the two groups (p = 0.694). The median PG PTV volume was 46.5 mL (range, 15.9 - 127.2 mL), and its mean dose, $D_{1\%}$, $V_{95\%}$ was 70.8 ± 0.65 Gy, 72.1 Gy, 69.8%, respectively. The overlapped volume between PG PTV and ARW was 13.4 mL. The mean dose and conformity index ($V_{95\%}/V_{PG\ PTV}$) did not show significant difference between the two groups (p=0.405). The average dose, $D_{1\%}$, $D_{50\%}$, $D_{70\%}$, V_{20Gy}, and V_{40Gy} for ARW were not significantly different between the two groups. However, V_{60Gy} had a tendency to be higher in Group 1 (p=0.087). Acute rectal and urinary toxicities occurred in 4 patients (12.9%) and 23 patients (74.2%), respectively, without Grade 3 or higher toxicity in both groups. No significant difference in rectal (p>0.999) and urinary (p=0.592) toxicity was showed between the two groups.
Conclusions: Proper dose constraint to PRW showed tolerable acute toxicity profile without compromising PG PTV conformity despite the risk of high dose distribution to ARW area. However, radiobiological analysis may be required together with dose-volume approach in this relative conservative dose constraint condition.

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Risk factors for acute toxicity in prostate cancer patients receiving hypofractionated IMRT

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